

## Invasive Plant Management

Condensed from **Invasive Alien Species: A Toolkit of Best Prevention and Management Practices** <http://www.cabi-bioscience.ch/wwwgisp/gt1goto.htm>

### Building Strategy & Policy

- policy & strategy must engage the human dimension of the invasive plant issues...since human behaviour has led to most invasions, it follows that solutions will need to influence human behaviour
- initial assessment necessary, which includes inventory of existing invasive plants, their ecological & economic impacts, and the ecosystems invaded
- Identify & involve all stake holders.
- Conspicuous invasive problems can be used to raise public awareness. Inform them about the problems caused and the management options available for solving or preventing the problem.
- Establish the vision, goals & objectives for the strategy.

### Prevention

- Identify pathways: species introduced intentionally (e.g. crops, ornamentals), accidental introductions, and vectors for spread after initial introduction.
- Education is a key component of successful prevention & management methods. The public has to be informed why prevention measures are taken and what impact failure can cause, and perceive prevention measures not as arbitrary nuisance but rather necessary aspects of travel & trade to care for the future commercial & natural environment.
- Utilize risk assessment systems on species and pathways.

### Early Detection

- Staff responsible for the surveys need to be trained and must include taxonomic knowledge, use of databases & identification services, and survey methods.
- Develop contingency plans which determine the action to be taken when a new invasive is found. Resources must be available for contingencies to work.
- Data collection & storage: it is important to keep a good record of species found and the action taken.

### Assessment & Management

- Invasive plant infestations need to be arranged in a priority list that considers the extent of the infestation, its impact, the ecological value of the habitats invaded, and the difficulty of control. Of highest priority would be those plants known to be invasive, small infestations, in areas of high conservation value, and likely to be controlled successfully.

- Initial assessment: determine the management goal and define the target area. All stakeholders need to be identified in the initial assessment and integrated in the entire process of a management program. Past control actions, their success or failure, and ecological risks should also be addressed.
- Four main strategies: eradication, containment, control, and mitigation.
- Eradication programs can be very costly and require full commitment until completion, so therefore are not always feasible.
- Containment restricts an invasive plant to a limited geographical range. Individuals spreading outside of the area are eradicated and introductions to the outside prevented.
- Control aims to reduce the density & abundance of the invasive to below an agreed threshold, thus lowering the impact. Under optimal conditions, native species will regain ground and crowd out the invasive.
- Simultaneous monitoring of eradication or control efforts keeps the project on track & identifies negative unexpected results, giving an opportunity to change & adapt the program.

#### Priorities for Management

- Priorities help minimize the total, long-term workload, and cost of an operation in terms of money, resources & opportunities.
- Highest priority should be given to existing infestations that are the fastest growing, most disruptive, and affect the most highly valued area/s.
- Also consider the difficulty of achieving satisfactory control, giving higher priority to those most likely to be controlled with the available technology & resources.
- Priority filters (use in any order):
  1. current & potential extent of the species on/near the site
  2. current & potential impact of the species
  3. value of the habitats/areas that the species does/may infest
  4. difficulty of control

## Management Strategies

- **Eradication** is the elimination of the entire population of an invasive species, including any resting stages. When prevention of an introduced species has failed, eradication is the preferred solution as a rapid response to an early detection, but should only be attempted if it is feasible. A careful analysis of the costs and likelihood of success must be made rapidly and resources mobilized. If eradication is achieved it is more cost-effective than any other measure of long-term control. If eradication fails, the entire investment may be wasted. Funding & commitment from all stakeholders must be secured, and for a longer time period than predicted to allow for unanticipated problems.
- **Containment** restricts the population in a defined geographical range. In order to establish this boundary there needs to be a clear understanding of why containment is being done in the first place, e.g. to protect particular areas from invasion, limited resources, allow time to mobilize other control measures etc. A species most likely to be successfully contained in a defined area is one that is moving slowly over short distances. Containment will need constant attention to the borders and prevention against spread.
- **Control** aims for the long-term reduction in density & abundance to below a pre-set threshold. The harm caused by the species under this threshold is considered acceptable with regard to damage to biodiversity and the economy. It is not always clear what this threshold should be set at in order to achieve the management objective. Suppression of the invasive species below that threshold can tip the balance in favour of native competing species. Control requires long-term funding & commitment but these lower recurring costs can be deceptive; in the long run effective control is more expensive in total than a successful eradication campaign.
- **Mitigation** is a last resort option to “live with” the invasive in the best achievable way and mitigate impacts on biodiversity. Mitigation with invasive plants involves the use of biological control agents. Inundative biological control involves large-scale, mass releases of pathogens, parasitoids or predators that will not reproduce and survive effectively in the ecosystem. Classical biological control is the most commonly used and is self-sustaining. Natural enemies selected for introduction are selected on the basis of their host-specificity to minimize or eliminate any risk of effects on non-target plant species. The aim is not eradication of the non-native plant, but to reduce its competitiveness with native species, hence reducing its density, and its impact on the environment.
- **Habitat Management**
  1. Prescribed Burning – many invasive plants are not adapted to fire; thus ecological burning may be an effective tool for controlling these species. Prescribed burning is particularly appropriate for restoring or maintaining fire-adapted or fire-dependent species and natural communities. Land managers must first determine if fire is a natural component in the plant community being considered.
  2. Grazing – grazing mammals can be a suitable option to obtain the desired plant cover. This method works best where the native plants are adapted to grazing.

3. Land Use – most invasions of non-native plants are caused by or at least favoured by human disturbance. Where possible, removing disturbance can help restore the native plant community and make control of invasives achievable.

#### Integrated Pest Management

- The concept of using different control methods in combination to achieve the desired results. Combining methods will often provide the most effective and acceptable control.
- The integration of methods based on ecological research, regularly monitored, and co-ordination will almost always achieve the best results in managing the invasives' population and reaching the overall goal.
- This integrated process needs an assessment of the situation and probably an experimental part for the best practice to establish management protocols.

#### Monitoring and Follow-Up

- In order to evaluate the success or failure of the management efforts, it will be necessary to monitor aspects such as the population of the invasive plant, the condition of the area under consideration, and changes in species composition and importance.
- Control activities, whether they involve eradication efforts, control actions taken, or taking no action at all, must be monitored over the period of the program.
- The targets set at the beginning will help to evaluate the success or failure of the program. To evaluate progress, a subset of targets should be set up which are on the way to the final goal.
- It should not be assumed that removing an invasive plant from an ecosystem will automatically lead to the return of native vegetation. Often this will happen, but in other cases, removal of one alien species may simply open the way for colonization by another.
- Start with small-scale activities to verify the impact of control operations, and if the results are not as expected, the management plan may need to be reconsidered and adapted in light of this new knowledge.

## Project Management

- A well managed control program should have a clear project plan:
  - Thorough preparation using databases and other available information, such as other's experience with a particular invasive.
  - Stakeholder involvement.
  - A timeline and milestones.
  - An adequate budget of money and time.
  - Be aware and 'up front' about the need for prolonged commitment to manage invasives in the long term.
  - Regular monitoring to see if milestones are reached.
  - Make sure monitoring is analysed rapidly to allow adaptive management/re-planning if control measures are not working.
  - Make data available to others with similar problems.

## Securing Resources

- A good proposal will:
  - Spell out the benefits in clear terms.
  - Maximize the capacity-building opportunities.
  - Seek & involve appropriate partners to raise funds.
  - Be clear on the timeframe and budget needed.
  - Be honest about the uncertainties.
  - Be reviewed to make sure that it is clear before submission.
- If the case for management of an alien plant can be linked directly to economic or social issues, this is likely to make it more attractive for government support and funding.

## Use of Volunteers

- In some cases, obvious results can be rewarding by themselves to many people, so that they volunteer their participation in the management of ecosystems.
- Remember that using volunteers and maintaining acceptable quality control is often difficult and requires experienced supervisors. Hence, community groups need to be trained.

## Tapping Other Resources

- The profile of an invasive plant can be raised in public opinion, for example by selecting a popular species that will benefit from the project and linking this species with the project.
- Newspapers, radio & television agencies need to be positively influenced to gain a more widespread increase in status for, and interest in, the project.

- Commercial companies may welcome opportunities for sponsorship, provide free herbicides, provide free tools & equipment, or provide snacks/refreshments for prestigious projects or special initiatives.

### Engaging Stakeholders

- A stakeholder is any person who will be affected, or think they will be affected, positively or negatively by the species or sites planned to be managed.
- Stakeholders should be consulted about the goals of the project and the activities that need to be undertaken to reach the goal.
- The process should be open and all questions and concerns raised by the stakeholders should be addressed.
- Where opinions differ, and agreement with or between some stakeholders cannot be achieved, some modification of the program should be considered if this will lead to agreement leading to healthy co-operation.
- It is helpful if the invasive plant can be portrayed as bad, causing serious damage to the natural environment. Often this is easy, but plants with pretty flowers can be loved by people.
- If an awareness campaign using the media is successful, the program will receive public attention and respect. If the public can actually be involved, people may start to identify with the project, try to help solve the problem, and will be proud to be part of a successful campaign.
- Co-ordination of press release and public events can very effective in raising the profile in the public eye.